

## Series PVT312

Microelectronic Power IC  
HEXFET® Power MOSFET Photovoltaic Relay  
Single Pole, Normally Open, 0-250V, 190mA AC/DC

### General Description

The PVT312 Photovoltaic Relay is a single-pole, normally open solid-state relay that can replace electromechanical relays in many applications. It utilizes International Rectifier's proprietary HEXFET power MOSFET as the output switch, driven by an integrated circuit photovoltaic generator of novel construction. The output switch is controlled by radiation from a GaAlAs light emitting diode (LED) which is optically isolated from the photovoltaic generator.

This SSR is specifically designed for telecom applications. PVT312L employs an active current-limiting circuitry enabling it to withstand current surge transients.

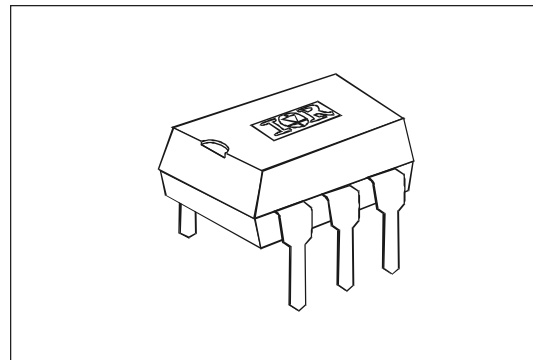
PVT312 Relays are packaged in a 6-pin, molded DIP package with either thru-hole or surface mount ("gull-wing") terminals. It is available in standard plastic shipping tubes or on tape-and-reel. Please refer to the Part Identification information opposite.

### Applications

- On/Off Hook switch
- Dial-Out relay
- Ring injection relay
- Ground start
- General switching

### Features

- HEXFET Power MOSFET output
- Bounce-free operation
- 4,000 V<sub>RMS</sub> I/O isolation
- Load current limiting
- Linear AC/DC operation
- Solid-State Reliability
- UL recognized and BABT certified
- ESD Tolerance:
  - 4000V Human Body Model
  - 500V Machine Model



### Part Identification

PVT312L	current limit, thru-hole
PVT312LS	current limit, surface-mount
PVT312LS-T	current limit, surface-mount, tape and reel
PVT312	no current limit, thru-hole
PVT312S	no current limit, surface-mount
PVT312S-T	no current limit, surface-mount, tape and reel

*(HEXFET is the registered trademark for International Rectifier Power MOSFETs)*

## Series PVT312

International  
**IR** Rectifier

### Electrical Specifications ( $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ unless otherwise specified)

INPUT CHARACTERISTICS		Part Numbers		Units
		PVT312L	PVT312	
Minimum Control Current (see figures 1 and 2)		2.0		mA
Maximum Control Current for Off-State Resistance @ $T_A = +25^{\circ}\text{C}$		0.4		mA
Control Current Range (Caution: current limit input LED, see figure 6)		2.0 to 25		mA
Maximum Reverse Voltage		7.0		V

OUTPUT CHARACTERISTICS		PVT312L	PVT312	
Operating Voltage Range		0 to $\pm 250$		$V_{(\text{DC or AC peak})}$
Maximum Load Current @ $T_A = +40^{\circ}\text{C}$ , 5mA Control (see figures 1 and 2)				
A Connection		170	190	mA (AC or DC)
B Connection		190	210	mA (DC)
C Connection		300	320	mA (DC)
Maximum On-State Resistance @ $T_A = +25^{\circ}\text{C}$ for 50mA pulsed load 5mA Control (see figure 4)				
A Connection		15	10	$\Omega$
B Connection		8	5.5	$\Omega$
C Connection		4.25	3	$\Omega$
Maximum Off-State Leakage @ $T_A = +25^{\circ}\text{C}$ , $\pm 250\text{V}$ (see figure 5)		1.0		$\mu\text{A}$
Current Limit @ $T_A = +25^{\circ}\text{C}$ , 5mA Control				
Connection:		A	C	
Minimum		190	330	n/a
Maximum		300	560	n/a
Maximum Turn-On Time @ $T_A = +25^{\circ}\text{C}$ (see figure 7) for 50mA, 100 $V_{\text{DC}}$ load, 5mA Control		3.0		ms
Maximum Turn-Off Time @ $T_A = +25^{\circ}\text{C}$ (See Fig. 6) For 50mA, 100 $V_{\text{DC}}$ load, 5mA Control		0.5		ms
Maximum Output Capacitance @ 50V <sub>DC</sub>		50		pF

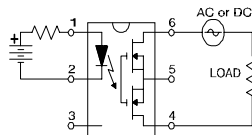
  

GENERAL CHARACTERISTICS		ALL MODELS		
Minimum Dielectric Strength, Input-Output		4000		$V_{\text{RMS}}$
Minimum Insulation Resistance, Input-Output @ $T_A = +25^{\circ}\text{C}$ , 50%RH, 100V <sub>DC</sub>		$10^{12}$		$\Omega$
Maximum Capacitance, Input-Output		1.0		pF
Maximum Pin Soldering Temperature (10 seconds maximum)		+260		$^{\circ}\text{C}$
Ambient Temperature Range:		Operating	-40 to +85	$^{\circ}\text{C}$
		Storage	-40 to +100	

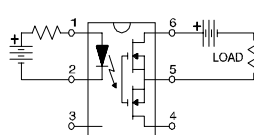
International Rectifier does not recommend the use of this product in aerospace, avionics, military or life support applications. Users of this International Rectifier product in such applications assume all risks of such use and indemnify International Rectifier against all damages resulting from such use.

## Connection Diagrams

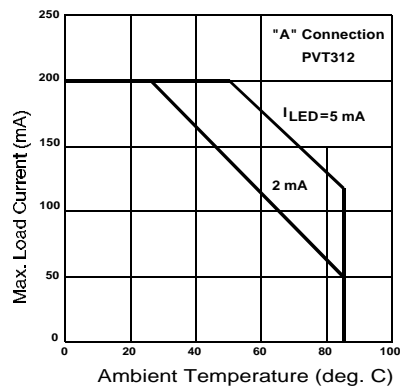
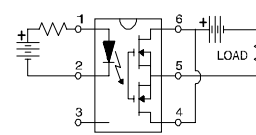
**"A" Connection**



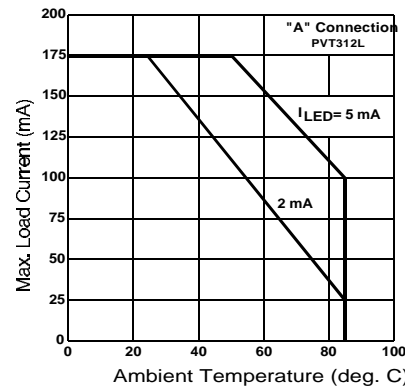
**"B" Connection**



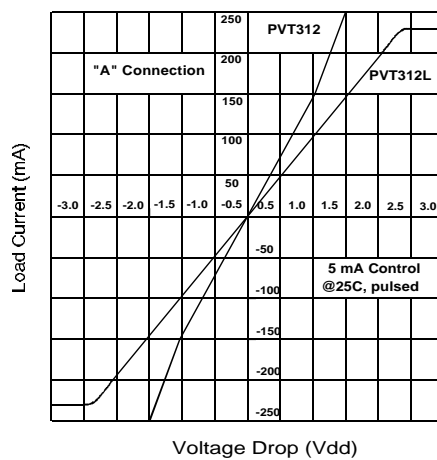
**"C" Connection**



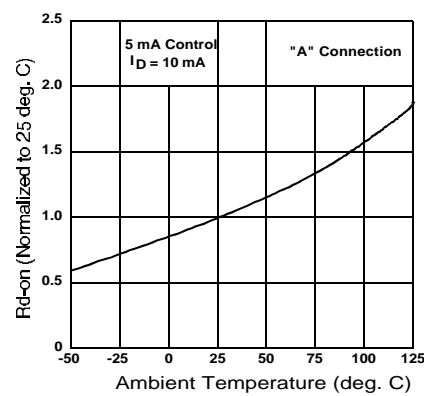
**Figure 1. Typical Current Derating Curves**



**Figure 2. Typical Current Derating Curves**



**Figure 3. Linearity Characteristics**



**Figure 4. Typical Normalized On-Resistance**

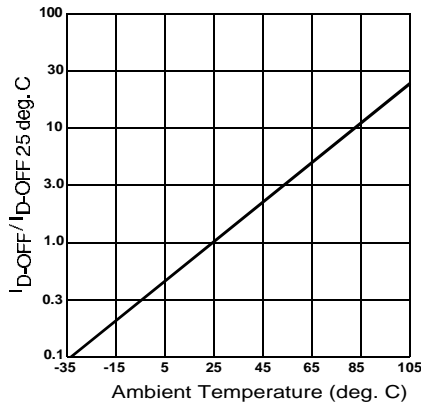


Figure 5. Typical Normalized Off-State Leakage

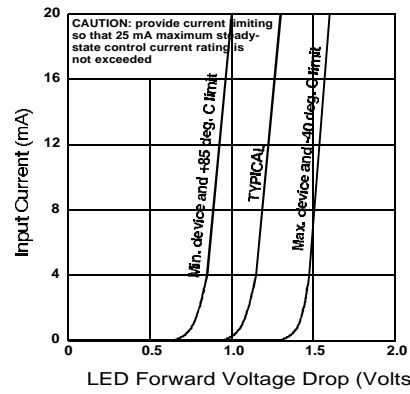


Figure 6. Input Characteristics (Current Controlled)

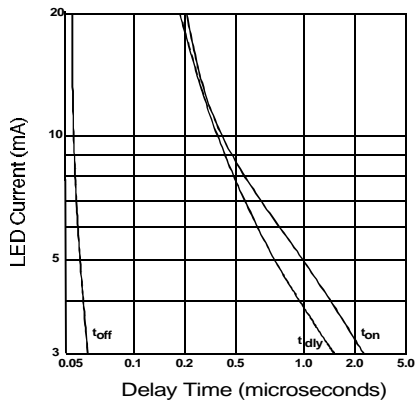


Figure 7. Typical Delay Times

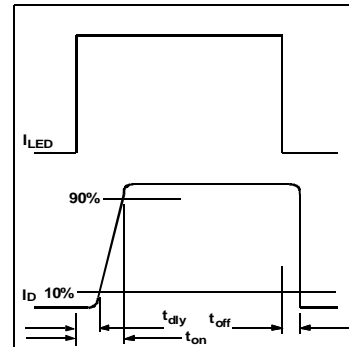


Figure 8. Delay Time Definitions

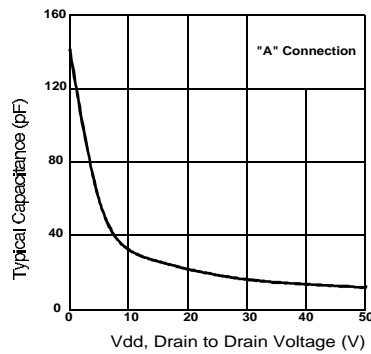


Figure 9. Typical Output Capacitance

## Case Outlines

